

Japanese Unexamined (*Kokai*) Patent Publication No. H1-318456, published December 22, 1989; Application No. S63-151966, filed June 20, 1988; Inventor: Toshishige FUKUDA; Assignee: Fujitsu KK

FACSIMILE COMMUNICATIONS SYSTEM

2. Claim

[Claim 1]

Facsimile communications system characterized in that, with a facsimile transmission system provided with a transmission device (101) for transmitting image information; a line-switching means (103), which executes the switching of lines based on an identification number introduced by the aforementioned transmission device and multiple receiving devices (105₁, 105₂, 105₃, ... 105_n), which receive the image information transmitted by the aforementioned transmission device (101) when respectively connected to the aforementioned line-switching means (103) and selectively connected to the aforementioned transmission device (101); it is comprised in that the aforementioned respective receiving devices (105₁, 105₂, 105₃, ... 105_n) have detecting means (109₁, 109₂, 109₃, ... 109_n) which detect whether or not reception is possible, and control means (107₁, 107₂, 107₃, ... 107_n) which execute line-switching control so that another receiving device (105) can receive signals when a transmission request is received by the aforementioned transmission device (101) in a state when the aforementioned detecting means (109₁, 109₂, 109₃, ... 109_n) detect that reception is impossible.

3. Detailed Explanation of the Invention

[Summary]

This concerns a facsimile communications system for when a designated receiving device cannot receive signals on a facsimile device group connected to a line-switching means.

The objective is to switch to another facsimile device that can receive signals and to execute the receiving of data.

The composition is such that with a facsimile transmission system provided with a transmission device for transmitting image information; a line-switching means, which executes the switching of lines based on an identification number introduced by the transmission device and multiple receiving devices, which receive the image information transmitted by the transmission device when respectively connected to the line-switching means and selectively connected to the transmission device; it is comprised in that the respective receiving devices have detecting means which detect whether or not reception is possible, and control means which execute line-switching control so that another receiving device can receive signals when a transmission request is received by the corresponding transmission device in a state when the detecting means detect that reception is impossible.

[Field of Use in Industry]

The present invention concerns a facsimile communications system; in particular, it concerns a facsimile communications system for when a designated receiving device cannot receive signals on a facsimile device group connected to a line-switching means.

[Prior Art Technology]

With known facsimile devices, communications lines are used, and image information from original documents such as characters, photographs, and the like can be

transmitted over long distances. At the present time, because of the fact that images can be communicated through public telephone lines, this type of facsimile device has generally become widespread in conversions to office automation.

Recently, the transmission of information using facsimile devices has increased, and the simultaneous receiving of data from multiple locations and the transmission and receiving of data at night have been occurring. Along with this, there has been a need for facsimile machines that can be used to handle these various situations without the intervention of human beings.

To handle this problem, devices provided with image information memory have been popularized.

With these facsimile devices, when image information is transmitted after being temporarily stored there, or transmitted information is printed, the image information can be temporarily stored when printing is impossible at the receiving side, due to a lack of paper, paper jams, or the like.

In particular, with the receiving of data, the system temporarily storing information and printing and outputting it after the elimination of problems is called intercepting.

[Problems the Invention is Meant to Resolve]

With the conventional system described above, it is necessary for a facsimile device having an image memory to be provided on the receiving side. The facsimile only has high value in the part having the memory function. With inexpensively priced popular machines, because there is no memory function or the memory capacity is small, when communications are impossible due to the recording paper running out, paper jams, and

the like, there has been the problem that intercepting has not been possible until the problem was eliminated through the hand of a human being.

Also, even if there was a memory function, there has been the problem that transfer instructions to other operable facsimile devices at the receiving side were impossible.

The present invention was created in consideration of these types of problems. The objective is that when a specified receiving-side facsimile device is incapable of receiving data, the receiving of data can be carried out by switching to another facsimile device that can receive data.

[Means for Resolving Problems]

Figure 1 is a fundamental block diagram of the facsimile communications system of the present invention.

In the drawing, the transmission device (101) transmits image information.

The line-switching means (103) executes the switching of lines based on an identification number introduced by the transmission device (101).

The respective receiving devices (105) receive the image information transmitted by the transmission device (101) when respectively connected to the line-switching means (103) and selectively connected to the transmission device (101).

The respective receiving devices (105) are comprised of detection means (109) and control means (107).

The detection means (109) detect whether or not reception is possible.

The control means (107) execute line-switching control so that another receiving device (105) can receive signals when a transmission request is received by the

aforementioned transmission device (101) in a state when the corresponding detecting means (109) detect that reception is impossible.

Thus, as a whole, based on the identification number transmitted from the transmission device (101), the transmission device (101) is connected to any of the receiving devices (105) through the line-switching means (103). In this case, the composition is such that, if the detection means (109) inside the selected receiving means (105) judges that receiving is impossible, the control means (107) is activated, and the transmission device (101) and other receiving device (105) are connected.

[Operation]

When image information is sent from the transmission device (101), the line-switching means (103) is connected to the receiving device (105) with the identification number specified by the transmission device (101).

Here, the detection device (109) contained in the selected receiving device (105) detects the state of whether or not reception by the receiving device (105) is possible.

If the receiving device (105) is in a state where reception is impossible, the detection means (109) notifies this fact to the control means (107).

When the control means (107) receives the notification that reception is impossible, it is connected to the transmission device (101) and another receiving device (105) through the line-switching means (103).

With the present invention, when the receiving device of the designated identification number cannot receive data, because of the fact that it is connected to another receiving device that can receive data from among the multiple receiving devices connected to the line-switching device (103), it is not necessary to add a new circuit, and

the receiving of data can be carried out by switching to another facsimile device where receiving is possible.

[Embodiment]

Below, an embodiment of the present invention is explained in detail with reference to the drawings.

Figure 2 shows the composition of the facsimile communication system in an embodiment of the present invention.

I. Corresponding Relationship Between the Embodiment and Figure 1

Here, the corresponding relationship between the embodiment and Figure 1 is shown.

The communications device (101) corresponds to the facsimile device (260).

The line-switching device (103) corresponds to the private branch exchange (PBX) (250).

The receiving device (105) corresponds to the facsimile devices (200, 210).

The control means (107) corresponds to the control element (201), the line-switching element (231), and the automatic dispatch circuit element (235).

The detection means (109) corresponds to the alarm detection circuit element (237).

The identification number corresponds to a telephone number.

With the correspondences as described above, an embodiment of the present invention is explained below.

II. Composition of the Embodiment

In Figure 2, the facsimile communication system using the facsimile communications method of the present invention is comprised of a facsimile device (260), which executes the transmission of image information; a PBX (250), which is connected to a line on the facsimile device of the telephone number indicating the facsimile device (260); and multiple facsimile devices (200, 210), which are connected by the PBX (250) and which undertake the receiving of image information.

The facsimile device (200) is provided with a control element (201), which undertakes control of the entire device; an operation panel (203), whereby an operator inputs instructions or data; a compress/restore element (213), which compresses transmitted data and restores received data; a recording element (215), which prints the image information of a received original document; a reading element (217), which reads the image information of a transmitted original document; a line control element (231), which controls the on-hook and off-hook states; a net control element (233), which controls external lines; an automatic dispatch circuit element (235), which dispatches calling signals to a separate receiving device; an alarm detection circuit element (237), which outputs a warning signal if communications are impossible with the facsimile device; and a communications information storage element (243), which stores communications information.

The control element (201) is connected to the operation panel (203), the communications information storage element (243), the compress/restore element (213), the line control element (231), and the alarm detection circuit element (237). Also, the compress/restore element (213) is connected to the recording element (215), the reading element (217), and the line control element (231); the line control element (231) is

connected to the net control element (233) and the automatic dispatch circuit element (235). Additionally, the automatic dispatch circuit element (235) is connected to the net control element (233).

Because the compositions of the facsimile devices (210 and 260) are respectively based on the composition of the facsimile device (200), they are omitted.

III. Operation of the Embodiment

Next, the operation of the facsimile communications system of the embodiment of the present invention described above is explained. The facsimile device (200) is to be in a state whereby receiving data is impossible due to paper running out, paper jams, or the like.

Figure 3 shows a means among the facsimile device (200), the PBX (250), and the facsimile device (260).

First, the transmission-origin facsimile device (260) calls the facsimile device (200) through the PBX (250). Based on the telephone number (identification number) from the facsimile device (260), the called facsimile device (200) is in a state where receiving is impossible due to the paper running out, paper jams, or the like; thus, the alarm detection circuit element (237) inside it operates, causing the control element (201) to be notified.

When the control element (201) inside the facsimile device (200) detects the warning from the alarm detection circuit element (237), the circuit control element (231) is caused to operate, and the circuit with the PBX (250) is temporarily (for about 500 ms) cut off.

The control element (201) activates the automatic dispatch circuit element (235), and using the transmission function of the PBX (250), the separate facsimile device (210) connected to the PBX (250) is called, and is connected to the device itself.

At the stage when the facsimile device (200) completes the connection with the facsimile device (210), the circuit between the PBX (250) is cut. Because of this, the facsimile device (210) which is called by the facsimile device (200) is connected to the facsimile device (260) through the PBX (250).

This series of operations is exactly the same as the transfer operation of an exchange telephone when a telephone is connected to a private branch exchange. When transferring to an external telephone, after the transferred party is connected, if the receiver is hung up and the line is disconnected, the outside line is connected to the transferred party, and a call is possible.

With the present invention, for example, when a telephone is transferred to a human being through a private branch exchange having a transfer function, the operation of temporarily cutting the telephone line with the external party is carried out by the line control element (231) inside the facsimile device, and the dialing operation is carried out by the automatic dispatch circuit element (235).

The facsimile device (210) connected in this way transmits a called station identification (CED) signal to the facsimile device (260). When the facsimile device (260) receives the CED signal from the facsimile device (210), the receiving side judges whether reception is possible, and the transmission of data to the facsimile device (210) is begun.

If the newly connected facsimile device (210) cannot receive data, by the same means, the transmission operation of data is repeated to another operable facsimile device (not shown in the drawings) connected to the PBX (250).

IV. Summary of the Embodiment

In this manner, when transmission of data is carried out to a facsimile device (200) that cannot receive data, the data use the functions inside the facsimile device (200) and the transfer function of the PBX (250), and are transferred to and received by another operable facsimile device (210), which is connected to the PBX (250).

Therefore, when a designated receiving-side facsimile device (200) cannot receive data, the data are received by switching to a facsimile device (210), which can receive data.

V. Alternate Modes of the Invention

With the embodiment of the present invention described above, this was a case where the facsimile device group connected to the private branch exchange did not have a memory, but even if there is a memory, this can be applied to a facsimile device in a state where it cannot store data.

Also, in I. Corresponding Relationship Between the Embodiment and Figure 1, there is an explanation of the corresponding relationship between the present invention and the embodiment, but the present invention is not limited thereto; various alternate modes may be easily conjectured.

[Results of the Invention]

As has been explained above, based on the present invention, when the receiving device of the designated identification number cannot receive data, because of the fact that

it is connected to another receiving device that can receive data from among the multiple receiving devices connected to the line-switching device , it is not necessary to add a new circuit, and the receiving of data can be carried out by switching to another facsimile device where receiving is possible; thus, this is extremely useful in practicality.

4. Simple Explanation of the Drawings

Figure 1 is a fundamental block diagram of the facsimile communications system of the present invention, Figure 2 shows the composition of the facsimile communication system in an embodiment of the present invention, and Figure 3 shows a means between facsimile devices and a PBX.

101: transmission device

103: line-switching means

105: receiving device

107: control means

109: detection means

200, 210, 260: facsimile devices

201: control element

203: operation panel

213: compress/restore element

215: recording element

217: reading element

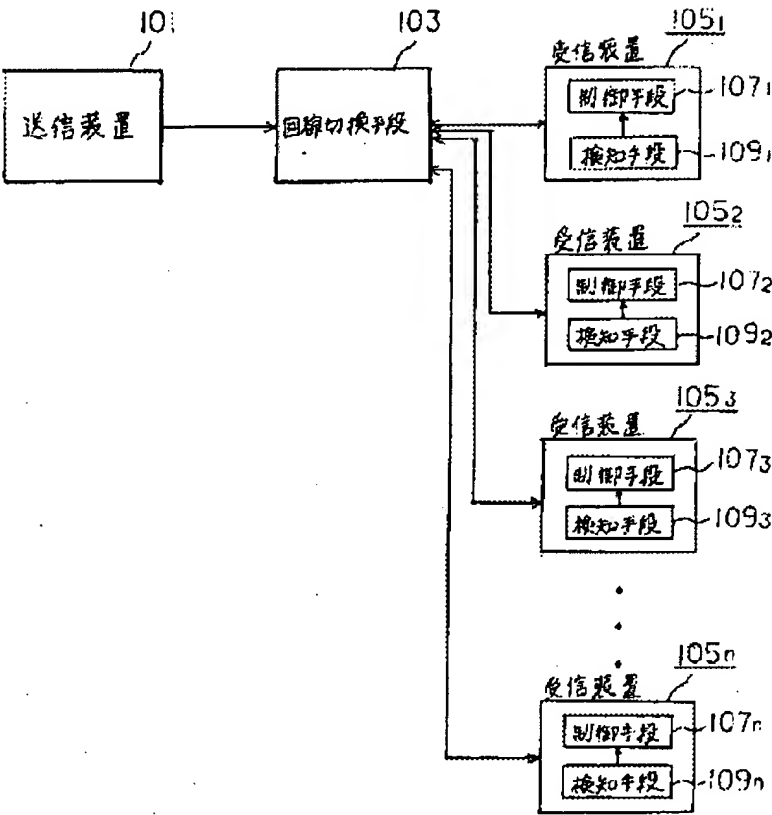
231: circuit control element

233: net control element

235: automatic dispatch circuit element

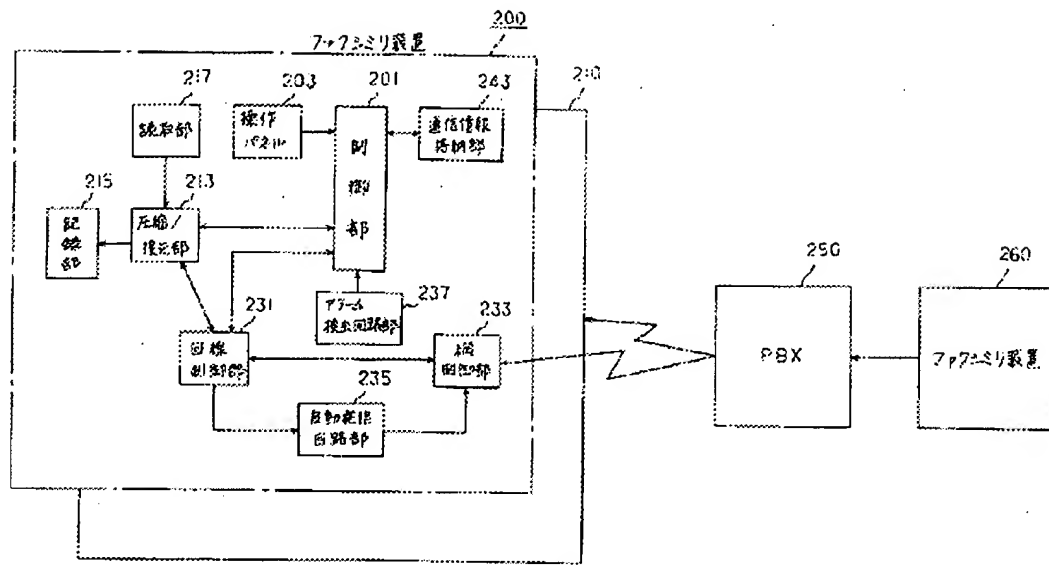
237: alarm detection circuit element

243: communications information storage element



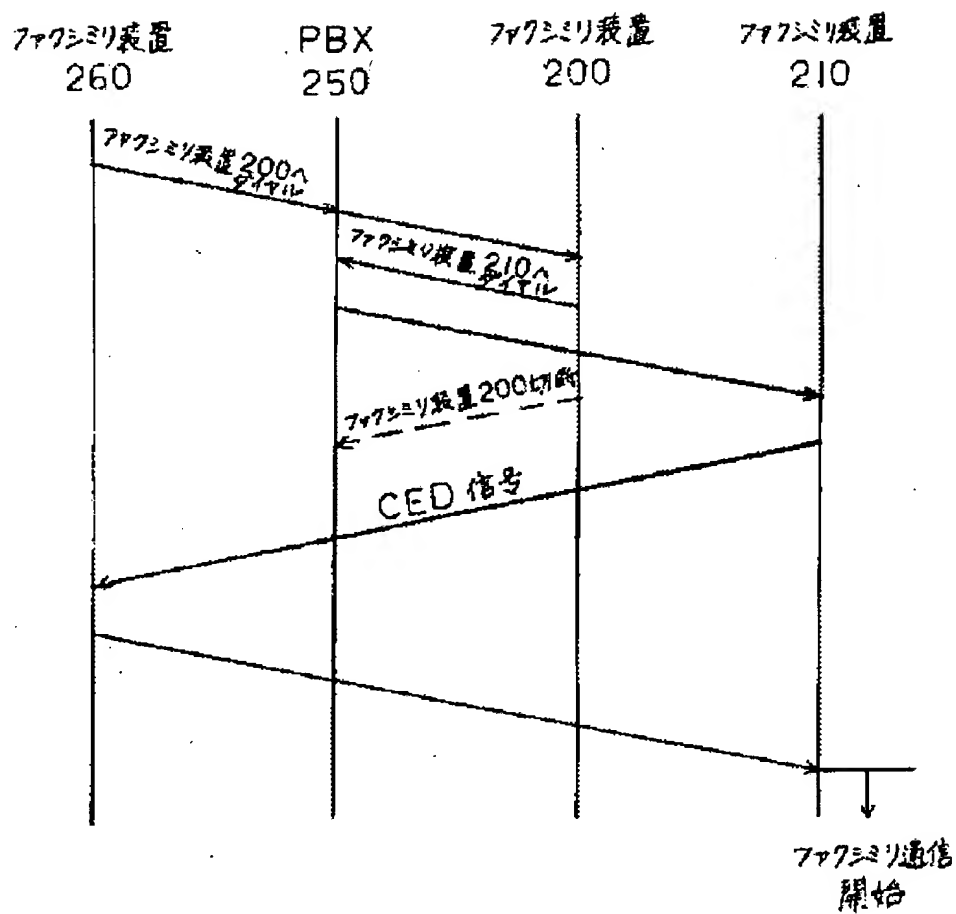
本発明の原理ブロック図

第 1 図



ファクシミリ通信システム構成図

第 2 図



送受信ファクシミリ装置とPBXの手順図

第 3 図

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